

WHAT IS CLAIMED IS:

1. A multi-wheel-driving vehicle, comprising:
three or more axles arranged in parallel along a longitudinal axis of said vehicle, each of said axles provided on both ends thereof with respective drive wheels, wherein one of said three or more axles is a steering axle provided with steerable drive wheels;
a pair of first and second transmission members, wherein said steering axle synchronously interlocks with said second transmission member, and wherein at least one of the other axles synchronously interlocks with said first transmission member; and
power dividing means interposed between said first and second transmission members, wherein power is transmitted through said power dividing means between said first and second transmission members while said power dividing means permits a difference of rotary speed between said first and second transmission members.
2. The multi-wheel-driving vehicle as set forth in claim 1, wherein said first and second transmission members are a pair of shafts disposed coaxially with each other, and wherein said power dividing means is a one-way clutch interposed between said pair of shafts.
3. The multi-wheel-driving vehicle as set forth in claim 1, wherein said power transmitted through said power dividing means is directed from said first transmission member to said second transmission member.
4. The multi-wheel-driving vehicle as set forth in claim 1, wherein said steering axle is the frontmost axle of said three or more axles.
5. The multi-wheel-driving vehicle as set forth in claim 1, wherein only said steering axle of said three or more axles synchronously interlocks with said second transmission member.

6. The multi-wheel-driving vehicle as set forth in claim 5, wherein said axles are three in total, and wherein the two axles other than said steering axle synchronously interlock with said first transmission member.

7. The multi-wheel-driving vehicle as set forth in claim 1, further comprising:

a brake provided on one of said three or more axles;

a manual brake-operating tool for operating said brake; and

locking means for locking said first and second transmission members together, wherein, when said brake-operating tool is operated for braking, said locking means is automatically operated to lock said first and second transmission members together.

8. The multi-wheel-driving vehicle as set forth in claim 7, wherein said brake is a wet-type brake.

9. The multi-wheel-driving vehicle as set forth in claim 7, wherein said one axle provided thereon with said brake is other than said steering axle.

10. The multi-wheel-driving vehicle as set forth in claim 7, wherein said axle provided thereon with said brake is divided into two halves, and wherein said brake is provided on one of said halves, further comprising:

a differential differentially connecting said halves with each other; and

differential-locking means for locking said two halves together, wherein when said brake-operating tool is operated for braking, said differential-locking means is automatically operated to lock said halves together.

11. A multi-wheel-driving vehicle, comprising:

three or more axles arranged in parallel along a longitudinal axis of said vehicle, each of said axles provided on both ends thereof with respective drive wheels, wherein one of said three or more axles is a steering axle provided with steerable drive wheels; and

power dividing means including an input member and a pair of output members, said power dividing means differentially sharing power transmitted into said input member between said pair of output members, wherein each of said input member and said pair of output members synchronously interlocks with at least one of said three or more axles.

12. The multi-wheel-driving vehicle as set forth in claim 11, wherein said power dividing means is a differential gear unit, and wherein said pair of output members are a pair of coaxial shafts provided thereon with respective differential side gears.

13. The multi-wheel-driving vehicle as set forth in claim 11, wherein said steering axle is the frontmost axle of said three or more axles.

14. The multi-wheel-driving vehicle as set forth in claim 11, wherein only said steering axle of said three or more axles synchronously interlocks with one of said input member and said pair of output members.

15. The multi-wheel-driving vehicle as set forth in claim 14, wherein said axles are three in total, and wherein the two axles other than said steering axle respectively synchronously interlock with the other two of said input member and said pair of output members.

16. The multi-wheel-driving vehicle as set forth in claim 14, wherein said steering axle synchronously interlocks with one of said output members.

17. The multi-wheel-driving vehicle as set forth in claim 16, wherein only said steering axle of said three or more axles synchronously interlocks with said one output member.

18. The multi-wheel-driving vehicle as set forth in claim 17, wherein said axles are three in total, and wherein the two axles other than said

steering axle respectively synchronously interlock with said input member and the other output member.

19. The multi-wheel-driving vehicle as set forth in claim 11, further comprising:

a brake provided on one of said at least three axles;

a manual brake-operating tool for operating said brake; and

locking means for locking said pair of output members together, wherein, when said brake-operating tool is operated for braking, said locking means is automatically operated to lock said pair of output members together.

20. The multi-wheel-driving vehicle as set forth in claim 19, wherein said brake is a wet-type brake.

21. The multi-wheel-driving vehicle as set forth in claim 19, wherein said one axle provided thereon with said brake is other than said steering axle.

22. The multi-wheel-driving vehicle as set forth in claim 19, wherein said axle provided thereon with said brake is divided into two halves, and wherein said brake is provided on one of said halves, further comprising:

a differential differentially connecting said halves with each other; and

differential-locking means for locking said two halves together, wherein when said brake-operating tool is operated for braking, said differential-locking means is automatically operated to lock said halves together.

23. A multi-wheel-driving vehicle, comprising:

three or more axles arranged in parallel along a longitudinal axis of said vehicle, each of said axles provided on both ends thereof with respective drive wheels, wherein one of said three or more axles is a steering axle provided with steerable drive wheels; and

power dividing means including an input member and a pair of output members, said power dividing means differentially sharing power transmitted into said input member between said pair of output members, wherein each of said three or more axles synchronously interlocks with either of said output members so that each of said output members synchronously interlocks with at least one of said axles.

24. The multi-wheel-driving vehicle as set forth in claim 23, wherein said power dividing means is a differential gear unit, and wherein said pair of output members are a pair of coaxial shafts provided thereon with respective differential side gears.

25. The multi-wheel-driving vehicle as set forth in claim 23, wherein said steering axle is the frontmost axles of said three or more axles.

26. The multi-wheel-driving vehicle as set forth in claim 23, wherein only said steering axle of said three or more axles synchronously interlocks with one of said output members.

27. The multi-wheel-driving vehicle as set forth in claim 26, wherein said axles are three in total, and wherein the two axles other than said steering axle synchronously interlock with the other output member.

28. The multi-wheel-driving vehicle as set forth in claim 23, further comprising:

a brake provided on one of said at least three axles;

a manual brake-operating tool for operating said brake; and

locking means for locking said first and second output members together, wherein, when said brake-operating tool is operated for braking, said locking means is automatically operated to lock said first and second output members together.

29. The multi-wheel-driving vehicle as set forth in claim 28, wherein said brake is a wet-type brake.

30. The multi-wheel-driving vehicle as set forth in claim 28, wherein said one axle provided thereon with said brake is other than said steering axle.

31. The multi-wheel-driving vehicle as set forth in claim 28, wherein said axle provided thereon with said brake is divided into two halves, and wherein said brake is provided on one of said halves, further comprising:

a differential differentially connecting said halves with each other; and

differential-locking means for locking said two halves together, wherein when said brake-operating tool is operated for braking, said differential-locking means is automatically operated to lock said halves together.

32. A multi-wheel-driving vehicle, comprising:

a prime mover;

three or more transaxle devices disposed in tandem along a longitudinal axis of said vehicle, wherein each of said transaxle devices includes input means and an axle serving as output means, said axle being provided on both ends thereof with respective drive wheels, wherein one of said three or more transaxle devices is a main transaxle device whose input means receives power from said prime mover prior to the other transaxle devices, and wherein one of said three or more transaxle devices is a steering transaxle device whose axle is provided with steerable drive wheels;

a pair of first and second transmission members, wherein power of said prime mover is taken out from said main transaxle device to said first transmission member, and wherein said second transmission member synchronously interlocks with at least one of said input means of the other transaxle devices other than said main transaxle device; and

power dividing means interposed between said pair of transmission members, wherein said power is transmitted through said power dividing means from said first transmission member to said second transmission member while said power dividing means permits a difference of rotary speed between said first and second transmission members.

33. The multi-wheel-driving vehicle as set forth in claim 32, wherein said first and second transmission members are a pair of shafts disposed coaxially with each other, and wherein said power dividing means is a one-way clutch interposed between said pair of shafts.

34. The multi-wheel-driving vehicle as set forth in claim 32, wherein said steering transaxle device is the frontmost transaxle device of said three or more transaxle devices.

35. The multi-wheel-driving vehicle as set forth in claim 32, wherein only said axle of said steering transaxle device of said axles of said three or more transaxle devices synchronously interlocks with one of said first and second transmission members.

36. The multi-wheel-driving vehicle as set forth in claim 32, wherein said steering transaxle device is other than said main transaxle device so that said input means of said steering transaxle device synchronously interlocks with said second transmission member.

37. The multi-wheel-driving vehicle as set forth in claim 36, wherein only said axle of said steering transaxle device of said axles of said three or more transaxle devices synchronously interlocks with said second transmission members.

38. The multi-wheel-driving vehicle as set forth in claim 37, wherein said transaxle device are three in total, and wherein said axles of the two transaxle devices other than said steering transaxle device synchronously interlock with said first transmission member.

39. The multi-wheel-driving vehicle as set forth in claim 32, further comprising:

a continuous variable transmission interposed between said prime mover and said input means of said main transaxle device.

40. The multi-wheel-driving vehicle as set forth in claim 39, further comprising:

a power-take-out portion for transmitting power to said first transmission member provided on an opposite side of said main transaxle device to said input means of said main transaxle device.

41. The multi-wheel-driving vehicle as set forth in claim 32, further comprising:

a brake provided on a transmission system or said axle in said main transaxle device;

a manual brake-operating tool for operating said brake; and

locking means for locking said input member and said pair of output members of said power dividing means together, wherein, when said brake-operating tool is operated for braking, said locking means is automatically operated to lock said input member and said output members together.

42. The multi-wheel-driving vehicle as set forth in claim 41, wherein said brake is a wet-type brake.

43. The multi-wheel-driving vehicle as set forth in claim 41, wherein said main transaxle device is other than said steering transaxle device.

44. The multi-wheel-driving vehicle as set forth in claim 41, wherein said axle provided thereon with said brake is divided into two halves, and wherein said brake is provided on one of said halves, further comprising:

a differential differentially connecting said halves with each other; and

differential-locking means for locking said two halves together, wherein when said brake-operating tool is operated for braking, said differential-locking means is automatically operated to lock said halves together.

45. A multi-wheel-driving vehicle, comprising:
a prime mover;

three or more transaxle devices disposed in tandem along a longitudinal axis of said vehicle, wherein each of said transaxle devices includes input means and an axle serving as output means, said axle being provided on both ends thereof with respective drive wheels, wherein one of said three or more transaxle devices is a main transaxle device whose input means receives power from said prime mover prior to the other transaxle devices, and wherein one of said three or more transaxle devices is a steering transaxle device whose axle is provided with steerable drive wheels; and

power dividing means including an input member and a pair of output members, said power dividing means differentially sharing power transmitted into said input member between said pair of output members, wherein each of all said input member and said pair of output members synchronously interlocks with at least one of all said axle of said main transaxle device and said input means of the transaxle devices other than said main transaxle device.

46. The multi-wheel-driving vehicle as set forth in claim 45, wherein said power dividing means is a differential gear unit, and wherein said pair of output members are a pair of coaxial shafts provided thereon with respective differential side gears.

47. The multi-wheel-driving vehicle as set forth in claim 45, wherein said steering transaxle device is the frontmost transaxle device of said three or more transaxle devices.

48. The multi-wheel-driving vehicle as set forth in claim 45, wherein only said axle of said steering transaxle device of said axles of said three or more transaxle devices synchronously interlocks with one of said input member and said output members of said power dividing means.

49. The multi-wheel-driving vehicle as set forth in claim 45, wherein said steering transaxle device is other than said main transaxle device

so that said input means of said steering transaxle device synchronously interlocks with one of said output members of said power dividing means.

50. The multi-wheel-driving vehicle as set forth in claim 49, wherein only said axle of said steering transaxle device synchronously interlocks with said one output member of said power dividing means.

51. The multi-wheel-driving vehicle as set forth in claim 50, wherein said transaxle device are three in total, wherein said axle of said main transaxle device synchronously interlocks with said input member of said power dividing means, and wherein said input means of the transaxle device other than said main transaxle device and said steering transaxle device synchronously interlocks with the other output member of said power dividing means.

52. The multi-wheel-driving vehicle as set forth in claim 45, further comprising:

a continuous variable transmission interposed between said prime mover and said input means of said main transaxle device.

53. The multi-wheel-driving vehicle as set forth in claim 52, further comprising:

a power-take-out portion for transmitting power to said first transmission member provided on an opposite side of said main transaxle device to said input means of said transaxle device.

54. The multi-wheel-driving vehicle as set forth in claim 45, further comprising:

a brake provided on a transmission system or said axle in said main transaxle device;

a manual brake-operating tool for operating said brake; and

locking means for locking said input member and said pair of output members of said power dividing means together, wherein, when said brake-operating tool is operated for braking, said locking means is

automatically operated to lock said input member and said pair of output members together.

55. The multi-wheel-driving vehicle as set forth in claim 54, wherein said brake is a wet-type brake.

56. The multi-wheel-driving vehicle as set forth in claim 54, wherein said main transaxle device is other than said steering transaxle device.

57. The multi-wheel-driving vehicle as set forth in claim 54, wherein said axle provided thereon with said brake is divided into two halves, and wherein said brake is provided on one of said halves, further comprising:

a differential differentially connecting said halves with each other; and

differential-locking means for locking said two halves together, wherein when said brake-operating tool is operated for braking, said differential-locking means is automatically operated to lock said halves together.